

Virginia

Standards of Learning Assessments

Test Blueprint

Grade 7 Mathematics

**2016 Mathematics
Standards of Learning**

**This revised test blueprint will be effective with the
administration of the 2018-2019 Mathematics Standards of
Learning (SOL) tests.**

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Grade 7 Mathematics Standards of Learning

Test Blueprint

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General Test Information

Test Blueprint

Much like the blueprint for a building, a test blueprint serves as a guide for test construction. The blueprint indicates the content areas that will be addressed by the test and the number of items that will be included by content area and for the test as a whole. There is a blueprint for each test (e.g., grade 3 reading, grade 5 mathematics, grade 8 science, Virginia and United States History).

The Grade 7 Mathematics blueprint contains information for two types of tests, the online computer adaptive test (CAT) and the traditional test. A CAT is an online assessment that is customized for every student based on how the student responds to the questions. This is in contrast to the traditional test in which all students who take a particular version (paper, large print, or braille) of the test respond to the same test questions. All online versions of the Grade 7 Mathematics Standards of Learning (SOL) test (including audio) are computer adaptive.

All students are required to take the online version of the SOL tests with the exception of students who meet the criteria for needing a paper test. All paper versions of the test (including large print and braille) will be administered using the traditional format. Beginning in spring 2019, there will no longer be a separate Plain English Mathematics assessment for English learners or students with disabilities who have documented significant language impairments. All test questions for Grade 7 Mathematics have been determined to meet the criteria for Universal Design. The Universal Design principles require that language that is not specific to the content area (e.g., mathematics) be simplified and test questions be written so they are accessible by all populations of students. The SOL test questions have been reviewed by Virginia teachers and have been determined to meet the criteria for Universal Design.

Reporting Categories

Each test covers a number of Standards of Learning. In the test blueprint, the SOL are grouped into categories that address related content and skills. These categories are labeled as reporting categories. For example, a reporting category for the Grade 7 Mathematics Standards of Learning test is *Measurement and Geometry*. Each of the SOL in this reporting category requires the student to measure, describe, or compare geometric figures. When the results of the SOL tests are reported, the scores will be presented for each reporting category and as a total test score.

Assignment of Standards of Learning to Reporting Category

In the Grade 7 Mathematics SOL test, each SOL is assigned to only one reporting category. For example, SOL 7.1a-e is assigned to “Number, Number Sense, Computation and Estimation.”

Coverage of Standards of Learning

Due to the large number of SOL in each grade level content area, every Standard of Learning will not be assessed on every SOL test. By necessity, to keep the length of a test reasonable, each test will sample from the SOL within a reporting category. All SOL are eligible for inclusion on the traditional forms as well as the CAT forms.

Use of the Curriculum Framework

The Grade 7 Mathematics Standards of Learning, amplified by the Curriculum Framework, define the essential understandings, knowledge, and skills that are measured by the Standards of Learning tests. The Curriculum Framework asks essential questions, identifies essential understandings, defines essential content knowledge, and describes essential skills students need to master.

Use of Calculators

The first section of the test will be taken without the use of a calculator. The SOL 7.1b-d will be assessed in the first section of the Grade 7 Mathematics test. All other SOL will be assessed in the second section with the use of a calculator.

Grade 7 Mathematics Test Blueprint Summary Table

Reporting Category	Grade 7 SOL	Number of Items Computer Adaptive Test (CAT) Format	Number of Items Traditional Format
Number, Number Sense, Computation, and Estimation	7.1a, b*, c*, d*, e 7.2 7.3	12	14
Measurement and Geometry	7.4a-b 7.5 7.6a-b 7.7	10	12
Probability, Statistics, Patterns, Functions, and Algebra	7.8a-b 7.9a-c 7.10a-e 7.11 7.12 7.13	20	24
Number of Operational Items		42	50
Number of Field-Test Items**		8	none
Total Number of Items on Test		50	50

*Items measuring these SOL will be completed without the use of a calculator.

**Field-test items are being tried out with students for potential use on subsequent tests and will not be used to compute students' scores on the test.

Grade 7 Mathematics Expanded Test Blueprint

Reporting Category: Number, Number Sense, Computation, and Estimation

Number of Items: 12 (CAT) 14 (Traditional)

Standards of Learning:

- 7.1 The student will
 - a) investigate and describe the concept of negative exponents for powers of ten;
 - b) compare and order numbers greater than zero written in scientific notation;
 - c) compare and order rational numbers;
 - d) determine square roots of perfect squares; and
 - e) identify and describe absolute value of rational numbers.
- 7.2 The student will solve practical problems involving operations with rational numbers.
- 7.3 The student will solve single-step and multistep practical problems, using proportional reasoning.

Reporting Category: Measurement and Geometry

Number of Items: 10 (CAT) 12 (Traditional)

Standards of Learning:

- 7.4 The student will
 - a) describe and determine the volume and surface area of rectangular prisms and cylinders; and
 - b) solve problems, including practical problems, involving the volume and surface area of rectangular prisms and cylinders.
- 7.5 The student will solve problems, including practical problems, involving the relationship between corresponding sides and corresponding angles of similar quadrilaterals and triangles.
- 7.6 The student will
 - a) compare and contrast quadrilaterals based on their properties; and
 - b) determine unknown side lengths or angle measures of quadrilaterals.
- 7.7 The student will apply translations and reflections of right triangles or rectangles in the coordinate plane.

Reporting Category: Probability, Statistics, Patterns, Functions, and Algebra
Number of Items: 20 (CAT) 24 (Traditional)
Standards of Learning:

- 7.8 The student will
- determine the theoretical and experimental probabilities of an event; and
 - investigate and describe the difference between the experimental probability and theoretical probability of an event.
- 7.9 The student, given data in a practical situation, will
- represent data in a histogram;
 - make observations and inferences about data represented in a histogram; and
 - compare histograms with the same data represented in stem-and-leaf plots, line plots, and circle graphs.
- 7.10 The student will
- determine the slope, m , as rate of change in a proportional relationship between two quantities and write an equation in the form $y = mx$ to represent the relationship;
 - graph a line representing a proportional relationship between two quantities given the slope and an ordered pair, or given the equation in $y = mx$ form where m represents the slope as rate of change;
 - determine the y -intercept, b , in an additive relationship between two quantities and write an equation in the form $y = x + b$ to represent the relationship;
 - graph a line representing an additive relationship between two quantities given the y -intercept and an ordered pair, or given the equation in the form $y = x + b$, where b represents the y -intercept; and
 - make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.
- 7.11 The student will evaluate algebraic expressions for given replacement values of the variables.
- 7.12 The student will solve two-step linear equations in one variable, including practical problems that require the solution of a two-step linear equation in one variable.
- 7.13 The student will solve one- and two-step linear inequalities in one variable, including practical problems, involving addition, subtraction, multiplication, and division, and graph the solution on a number line.